AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application. Please cancel claims 51-147 without prejudice. Please amend the claims as indicated below without prejudice.

1. (Original) A system for separating molecules having different charges and capturing a molecule of interest for detection, comprising:

a) a microstructure plate comprising:

at least one microstructure, each microstructure comprising a series of microstructure sections and channels, wherein each microstructure section is directly interconnected to at least one other microstructure section by at least one channel, the series comprising:

at least one sample accepting microstructure section, wherein the sample accepting section is fluidly connected to the exterior of the microstructure plate;

at least one first electrode microstructure section;

at least one second electrode microstructure section;

at least one capture microstructure section containing a capture matrix, wherein the capture microstructure section is between the first and second electrode microstructure sections in the series;

wherein the microstructures in the microstructure plate are formed by at least two layers of material, wherein at least one layer is a sealing plate layer which seals at least one channel or microstructure section in the assembled microstructure plate; and

b) an electrode assembly, the electrode assembly having at least one first and at least one second electrode, wherein each first electrode microstructure section is in electrical contact with at least one first electrode, and wherein each second electrode microstructure section is in electrical contact with at least one second electrode.

2. (Original) The system of claim 1 wherein the sealing plate comprises at least one opening to the exterior of the microstructure plate.

3. (Original) The system of claim 2 wherein at least one opening of the sealing plate aligns with at least one sample accepting microstructure section.

4. (Original) The system of claim 2 wherein at least one opening of the sealing plate aligns with at least one electrode microstructure section.

5. (Original) The system of claim 4 wherein each electrode of the electrode assembly extends through at least one opening in the sealing plate towards at least one electrode microstructure section.

6. (Original) The system of claim 2 wherein at least one opening of the sealing plate aligns with the capture microstructure section.

7. (Original) The system of claim 1 wherein at least one layer of the microstructure plate other than the sealing plate comprises at least one opening to the exterior of the microstructure plate.

8. (Original) The system of claim 7 wherein at least one opening of the non-sealing plate layer aligns with at least one sample accepting microstructure section.

9. (Original) The system of claim 7 wherein at least one opening of the non-sealing plate layer aligns with at least one electrode microstructure section.

10. (Original) The system of claim 9 wherein each electrode of the electrode assembly extends through at least one opening in the non-sealing plate layer towards at least one electrode microstructure section.

11. (Original) The system of claim 1 wherein the microstructure unit comprises two capture microstructure sections, wherein one capture microstructure section is positioned in the series between the sample accepting microstructure section and the first electrode microstructure section, and the second capture microstructure section is positioned in the series between the sample accepting microstructure section and the second electrode microstructure section.

12. (Original) The system of claim 1 wherein at least one layer of the microstructure plate is transparent to light.

13. (Original) The system of claim 1 wherein the capture matrix comprises a material having the ability to covalently or non-covalently bind at least one molecule of interest.

14. (Original) The system of claim 13 wherein the capture matrix is positioned within the capture microstructure section so that the molecule of interest travels across the microstructure tangential to the surface of the capture matrix when the first and second

electrodes are energized to produce an electric field.

15. (Original) The system of claim 13 wherein the capture matrix is positioned within the capture microstructure section so that the molecule of interest travels through the microstructure orthogonal to the surface of the capture matrix when the first and second electrodes are energized to produce an electric field.

16. (Original) The system of claim 13 wherein the capture matrix binds the molecule of interest specifically.

17. (Original) The system of claim 16, wherein the capture matrix comprises an affinity binding material selected from the group consisting of antibodies, streptavidin and avidin.

18. (Previously Presented) The system of claim 13, wherein the capture matrix binds the molecule of interest non-specifically.

19. (Previously Presented) The system plate of claim 18 wherein the capture matrix comprises a material selected from the group consisting of metal chelate resins, anionic resins, cationic resins, polyvinylidine fluoride, nitrocellulose and charged nylon.

20. (Original) The system of claim 1 wherein the capture matrix impedes the movement of a molecule of interest.

21. (Original) The system of claim 20 wherein the capture matrix comprises a material selected from the group consisting of cellulose, glass fiber, nylon, and hydrogels.

22. (Original) The system of claim 21 wherein the capture matrix is a hydrogel selected from the group consisting of agarose, polyacrylamide, aminopropylmethacrylamide, 3-sulfopropyldimethyl-3-methacrylamidopropylammonium inner salt, methacrylic acid, 3-sulfopropylmethacrylate potassium salt, glycerylmonomethacrylate, and derivatives thereof.

23. (Original) The system of claim 20 wherein the capture matrix is positioned within the capture microstructure section so that the molecule of interest travels through the microstructure orthogonal to the surface of the capture matrix when the first and second electrodes are energized to produce an electric field.

24. (Original) The system of claim 1 wherein at least two channels connecting at least three microstructure sections lie in a three-dimensional configuration.

25. (Original) The system of claim 1 wherein the channels connecting the microstructure sections lie in a substantially planar configuration.

26. (Original) The system of claim 1 wherein the microstructure plate is comprised of more than two layers of material, the layers comprising a plurality of voids which define the microstructure sections and channels when the layers are aligned.

27. (Original) The system of claim 26 wherein the voids defining the channels of

the microstructure lie within a single layer.

28. (Original) The system of claim 26 wherein the voids defining the channels of the microstructure lie within more than one layer.

29. (Original) The system of claim 26 wherein the capture matrix is held between two layers in order to position it within the capture microstructure section.

30. (Previously Presented) The system plate of claim 26 wherein at least one layer is formed from a self-sealing material.

31. (Previously Presented) The system of claim 30 wherein at least one layer is formed from a self-sealing material.

32. (Previously Presented) The system plate of claim 26, wherein at least one layer is formed from polytetrafluoroethylene.

33. (Original) The system of claim 1 wherein the channels between the microstructure sections of the microstructure have a cross-sectional area between 10,000 and 9,000,000 μm^2.

34. (Original) The system of claim 1 wherein the channels between the microstructure sections of the microstructure have a cross-sectional area between 10,000 and 250,000 μm^2.

35. (Original) The system of claim 1 wherein the channels between the microstructure sections of the microstructure have a cross-sectional area between 25,000 and 250,000 μm^2.

36. (Original) The system of claim 1 wherein the microstructure plate is approximately 8.5 cm. by 11 cm.

37. (Original) The system of claim 36 wherein the microstructure plate comprises a plurality of rectangularly arrayed microstructures.

38. (Original) The system of claim 37 wherein the microstructure plate comprises 96 rectangularly arrayed microstructures.

39. (Original) The system of claim 37 wherein the microstructure plate comprises 384 rectangularly arrayed microstructures.

40. (Original) The system of claim 37 wherein the microstructure plate comprises 1536 rectangularly arrayed microstructures.

41. (Original) The system of claim 37 wherein the electrode assembly comprises 192 regularly arrayed sets of first and second electrodes.

42. (Original) The system of claim 37 wherein the electrode assembly comprises

768 regularly arrayed sets of first and second electrodes.

43. (Original) The system of claim 37 wherein the electrode assembly comprises 3072 regularly arrayed sets of first and second electrodes.

44. (Original) The system of claim 1 wherein the electrode assembly is integrated within the material of the microstructure plate.

45. (Original) The system of claim 44 wherein the electrode assembly is embedded within the sealing plate.

46. (Original) The system of claim 44 wherein the electrode assembly is a printed circuit on the sealing plate.

47. (Original) The system of claim 44 wherein the electrode assembly is held between two layers of the microstructure plate.

48. (Original) The system of claim 1 wherein the electrode assembly comprises an electrode support plate formed from a rigid or semi-rigid material, the electrodes being fixedly held on or within the electrode support plate.

49. (Original) The system of claim 1 wherein each pair of first and second electrodes in the electrode assembly is controlled individually.

50. (Original) The system of claim 1 wherein all first electrodes in the electrode assembly and all second electrodes in the electrode assembly are controlled together.

Claims 51-147. (Canceled)